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ABSTRACT

This paper describes the organization, implementation, and outcomes of a joint effort between the Regional Laboratory for Educational Improvement of the Northeast and Islands and the Vermont State Department of Education's Database Project. In 1987, the Laboratory proposed a feasibility study to examine the means and costs of accessing comprehensive sets of data regarding rural schooling within a single state. Vermont was selected as the study site because the Vermont Legislature had included a mandate and funding for the development of a unified educational database. The Laboratory's Rural Initiative proposal specified two objectives related to Vermont's development of a statewide database: (1) to observe and document the challenges faced by Vermont in its effort to create the database to better understand the nature of challenges that other rural states will face as they mount similar efforts, and to identify the kinds of assistance that seem most helpful; and (2) to assist in solving problems and finding solutions throughout the development process. The plan called for a 6 month effort, July through December, 1987, to identify current data elements in 4 categories (student, staff, school, and district) and to specify hardware and software requirements. Implementation of the unified database began in January, 1988. Results of the initiative and the problems encountered are reported, as well as the "on-hold" status of the project as of August, 1988. (ALL)

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VERMONT STATE DEPARTMENT OF EDUCATION

DATABASE PROJECT

BY

Don Horsley

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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Vermont State Department of Education Database Project

Don Horsley

Introduction

The Regional Laboratory's formal involvement with the Vermont State Department of Education's (SDE's) Database Project began in July, 1987. Laboratory staff outlined The Regional Lab's Rural Initiative for the deputy commissioner of the department and proposed a feasibility study to examine the means and costs of accessing comprehensive sets of data regarding rural schooling within a single state. The Laboratory had selected Vermont as the study site because of its rurality and because the Vermont Legislature had included funding and a mandate for development of a unified educational database in its authorization for the SDE budget in State Fiscal Year 1988.

The Rural Initiative proposal specified two objectives related to the SDE's development of a statewide database:

- To observe and document the challenges faced by Vermont in its effort to create the database in order to (a) better understand the nature of challenges that other rural states will face as they mount similar efforts, and (b) identify the kinds of assistance that seem most helpful.

- To assist in problemsolving and solution finding throughout the development process.

The Lab and the Vermont SDE entered into a Memorandum of Agreement that accepted these two objectives. In addition to Lab activities directed at documentation and understanding of the database development effort, the Lab commissioned two papers from a University of Vermont College of Education faculty member who is a specialist in both rural education and database development and management. Content of the papers -- issues, implications, and preliminary specifications for developing a statewide management information system -- was arrived at through joint meetings between the faculty consultant, SDE staff, and Lab staff.

The SDE's workplan called for a six-month effort, July through December, 1987, to identify current data elements in four categories -- student, staff, school, and district -- and to specify hardware and software requirements. Systems requirements were to be advertised for competitive bids and purchase by the end of 1987. Implementation of the unified database was to begin in January, 1988.

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The project proved to be much larger and more complex than the Department of Education had anticipated, and the SDE's two most critical positions, the Commissioner and Deputy Commissioner, changed hands in early 1988. Project timelines were not met, and the database project was on "hold" status as of August, 1988.

Background and Criteria for the SDE Database

One of the primary issues for the Vermont Legislature during the 1987 legislative session (as well as several previous sessions) was state aid to education. It is a recurring theme since there is widespread acknowledgement that significant disparities exist among Vermont's 250+ school districts. Vermont is among the most rural of states, and significant tax-paying businesses are either concentrated around the City of Burlington or are found in a half-dozen or so major ski areas. The tax base for schools is largely derived from town property taxes, with minimal contributions from the state. The difference in town spending per pupil varies by as much as $2,000.

Numerous legislative proposals for redistricting and more equitable financing have been considered, and none have been enacted. Most observers attribute this to the state's strong history of local control and governance by town meeting. As part of an effort to get past the legislative impasse on state aid to education, the 1987 Legislature included an appropriation for development of a statewide education database and management information system. This was intended to provide the state with accurate, timely, and uniform information on educational spending in each of Vermont's school districts -- information that could lead to better informed choices about state aid formulas.

In operationalizing the legislative mandate, the State Department of Education also saw an opportunity to streamline and refine its means of collecting, analyzing, and sharing a wide range of information on students, school staff, school facilities, and other educational topics. The Commissioner of Education assigned overall responsibility for the database project to his Deputy Commissioner.

The Deputy Commissioner defined the scope of the project as one of determining what the SDE's information base ought to consist of in order to (1) financially manage Vermont's educational system, (2) provide an ongoing research database for state and local use in planning and analysis, and (3) to provide executive, legislative, and local officials with accurate information with which to make policy decisions about the future of education in Vermont.

After preliminary meetings with key SDE staff representing program and administrative units, the Deputy Commissioner outlined the criteria for the education database. In a memorandum of 11 June 1987, he informed the Commissioner that criteria for the system consisted of:

ACCESS:

A single, consistent, rational and integrated data base will be available for the Department.

It will include the ability to:

- manipulate and draw conclusions and reports from the data base.
- generate all required state and federal reports, manage all grants, perform state aid calculations and distributions.
- be queried for new and special reports in response to policy issues that arise.
- set up a publicly accessible subset of data, reachable via dial up and network access.

CONTROL:

There will be a single, predefined and closely-controlled system for entry of information.

Read-only access will be available to the Department staff and public, in a form usable with microcomputers.

The Department will define the nature of the data file(s) to be sent from local districts; local accounting systems will need to be designed to produce those file(s).

COMMUNICATIONS

Data collection will be done "over the wire": there will be no paper, no punching.

Collection from the field will be done periodically, at a variety of times, from a variety of machines.

Dial-up communications and access will be built in with simple user friendly front end.

The Deputy Commissioner appointed an Ad Hoc Information Committee with representatives from each SDE Division involved in information management, and one staff member was assigned to coordinate the Committee's work on a full-time basis through December, 1987. The thirteen members of the Committee represented the following Divisions and sub-units:

- Deputy Commissioner
- Commissioner's Office
- Department Services (SDE administrative services)
- Statistics
- Auditing
- Accounting
- Child Nutrition
- Curriculum and Instruction
- Certification
- Public School Approval
- Adult and Vocational Education
- Special Education
- Compensatory Education

Components of the SDE Database

The Committee's initial objective was to identify a list of elements, including fiscal, student, staff, facilities, performance indicators, and demographics for each school and district.

The range of information to be contained in the database was previously defined by the Deputy Commissioner in his June 11 memorandum to the Commissioner:

> Fiscal: revenues, expenditures by code to whatever level of detail is necessary, balance sheet, operating statement, periodically by each district, coded to 385 schools. All grants management included.
>
> Student: enrollment by program, residence, age, grade, program, district, school.
>
> Indicators: continuation rates, dropout, academic performance, PSA [Public School Approval] standards.
>
> Staff: for certified staff: name, assignments, certification status, salary, demographics, background and experience, individual records; for other staff, aggregate data only by school.
>
> Facilities: fiscal, buildings, rooms, heating, square feet, floors, age, special capabilities.
>
> Demographics: population by age, sex, race, grand list, tax rates, wealth (various measures), roads, sparsity.
>
> Activity Record: consultant visits, awards, special grants.

As the Ad Hoc Information Committee began identifying current databases within the department, it soon became apparent that there was more information to consider than anyone had anticipated:

- Seventeen databases for students were identified within the first six weeks, and others were uncovered as the project progressed. The databases collect information in more than twenty-three (23) categories.

- Seven databases for salaried and contracted school staff, with information in nineteen (19) categories.

- Eight databases for schools and districts, with an undetermined number of variables.

In comparing the known databases with the SDE's preliminary list of desirable components in a statewide database, the project's full-time coordinator commented that, "In one way or another, we're already asking for everything we've listed." The lists of the types of student databases and variables convey the wealth of information available to the Department:

	Database Type	*Group Data*	*Ind. Data*
1.	Total student enrollment	93,000	
2.	Total student admissions	93,000	
3.	Wards of the State		500
4.	Child nutrition (pre-school not included)	93,000	
5.	Driver education enrollment		8,000
6.	Early education initiative	300	
7.	Private schools and home study		9,200
8.	Chapter 2	?	
9.	Secondary vocational	6,000	
10.	Afternoon/evening vocational and firefighters	6,000	
11.	Adult basic education (individual data at agency; group data reported to state)	5,000	
12.	Job Training Partnership Act (ind. data at local level; some sent to state; some to State Dept. of Employment & Training)		2,500

13.	Special education child count		11,000
14.	Compensatory education	10,000	
15.	State Dept. of Corrections (ind. data at Dept. of Corrections; group data to SDE)		1,100
16.	Migrant students		1,200
17.	Limited English proficiency		250
18.	Post-high school data collection	6,000	

Student Variables

1. Name
2. Date of birth
3. School
4. Town of residence
5. Sex
6. Custody status
7. Race
8. Citizenship
9. Social Security #
10. I.D. # (special education)
11. Criminal record
12. Parent demographics
14. Adult learner demographics
15. Hot lunch status
16. Driver education grade
17. Program of study (vocational)
18. Special education services
19. Achievement outcomes (vocational skills, competencies, basic skills)
20. Handicapping condition
21. Educationally disadvantaged (compensatory education)
22. Economically disadvantaged (JTPA)
23. Limited English proficiency

But while the quantity of information being collected was more than adequate, the utility (and, therefore, the quality) of it was not. The Committee soon determined three critical problem areas among the student, staff, and district/school databases: (1) duplication of individual students from one database to another, (2) lack of common definitions and identifiers across the databases, and (3) local definitions of requested information that might change when staff changes occurred at the reporting level.

A brief analysis of student databases, for example, demonstrated that a single student could be reported on as many as twelve discrete databases without knowledge of the duplication. The lack of common definitions and identifiers is especially apparent among the school and district databases, where superintendents and principals in the same districts may use different definitions for "building" or "school" reporting purposes,

and where differences are even greater across districts. A middle school complex of three buildings, for example, might be reported by a superintendent as three schools, by the principal as one school, and the succeeding principal a year later might revert to calling it three. This is the reason why the SDE refers to "Vermont's 300 to 400 schools" in its official communications.

These issues led the Deputy Commissioner and the Committee to consider what the essential database components should be. An informal list of guiding questions was developed for deciding to include or exclude variables and whole reports. In asking the questions of themselves and others, Committee members were clear in distinguishing between "needing" the information, versus "wanting it" for strong reasons, versus "merely would like to have for future reference." Among the questions were:

- Who needs the information? How many different SDE divisions/units need it and are currently collecting it?
- Who defines the variables? Can the SDE redefine them or establish a common definition across databases?
- Why is it needed? To whom or where is it reported?
- When and how often is it needed?
- How is the information collected? From whom? When?
- How is it reported?

Perhaps the greatest surprise was that SDE program staff had the longest and most detailed list of information requests, a fact that ran counter to the notion that it would be the fiscal managers, accountants, and auditors who would present the most detailed list of information requests. In fact, it was the large number of information requests from program staff that pointed the way to making clear distinctions between "needing" information necessary to meet their responsibilities, "wanting" information that would likely be useful for planning and analysis, and, finally, desiring information that might prove to be useful in the future.

Early on, then, the Committee recognized that the Department already possessed the essential components for a statewide educational database. In fact, the Department had too much information at its disposal, and the real conflict had to do with the vested interests in, and definitions of, components that would ultimately be recommended for inclusion in the uniform database.

Chronology and Conclusion of the SDE Database Project

The SDE Database Project was formally initiated in June, 1987, and appointment of the Ad Hoc Committee completed in late August. In the interim, the Deputy Commissioner met with the SDE's Division Directors to formulate a concept for the project and a

strategy for carrying it out. His initial plan was to hire a management information systems consultant to work under the direction of a small group of department staffers. However, a preliminary analysis of hardware and software costs for the system indicated that all staff work would have to be absorbed from within the department, and a SDE staff member was temporarily reassigned to the project.

The Ad Hoc Committee met as a whole every other week from mid-September through December, 1987. In addition, sub-groups sometimes met on a weekly basis.

In the ensuing two months, the Committee identified all SDE reports and databases, analyzed them for duplication and discrepancies in definition of terms, and prepared an overview of the reports and databases for Department-wide review and comment.

By mid-November, the Committee had developed first and second drafts of a proposed statewide database, prepared a cover memorandum explaining the project and rationales, and included in the package a six-item feedback questionnaire. The memo, proposed database components and questionnaire were presented to key educational constituents throughout the state. Briefings were made by the Deputy Commissioner to State Legislators and to statewide associations representing teachers, school and district business managers, principals, superintendents, and special interest groups affected by data and report requests.

In addition to the criteria established at the beginning of the project, the memorandum invited comments on an expanded list:

- Confidentiality of individual records, both student and staff.
- Access to the system by the public, school officials, other state agencies, and others.
- Flexibility of the system, including piggy-backing onto existing local computerized systems, or offering optional software packages for local administrative functions.
- Quality control of data entry.
- Timeline for complete implementation statewide.

The Committee's proposed set of variables for the statewide database was largely the same for students and considerably expanded for staff; school and district data requirements would rely on aggregation of student and staff data to the maximum extent possible. In its cover memorandum the committee did not convey the confusing array of student, staff, and school/district databases and the lack of coordination that resulted from duplicate reporting and multiple definitions of variables. It simply stated that the Legislature had given funds and a mandate to the Department "...to develop a unified educational data base for Vermont.... Our intent is to simplify all reporting through a unified, integrated, core data base of educational information."

By mid-November, the Committee had received the first of two reports from the Lab's University of Vermont consultant on database development. While the review of statewide database development in general, and of rural databases in particular, was most helpful to the Committee, members were clearly disappointed to learn that no integrated statewide educational database system currently exists anywhere in the country. The Committee had hoped to point to a precedent for SDE imposition of new standards regarding individualized information. Without this precedent, Vermont's system would likely be focused on the school, rather than the student, as the unit of analysis.

In sum, the consultant's report and the prospect of inviting public comment for the first time raised Committee members' personal concerns about having to defend a project that might not be perceived as beneficial, but rather as part and parcel of ongoing state-level deliberations that seemed to be leading ever closer to loss of local control.

By the end of December, some Committee members had their worst fears confirmed. At what was to be their final meeting before advertising for bids for a hardware/software consultant, a lengthy discussion was reopened about defining variables and the need for some proposed reports. While the Deputy Commissioner was operating in part from his understanding of the Legislature's mandate to the Department, Committee members were responding to two other issues: public pressure that had begun to emerge after the November mailing and briefings, and the then-recent announcement of the Commissioner's resignation that would become effective in less than two months.

The Deputy Commissioner responded to Committee concerns. The start-date for the statewide database was moved back to July 1, 1988, and a streamlined five-member Committee was given full responsibility for developing final specifications for variables and reports, with special emphasis placed on fiscal issues.

The Department moved forward with hiring an outside consultant for developing hardware and software specifications, the new Ad Hoc Committee completed its work in June, 1988, and plans had been fully developed to begin implementation by July 1, 1988. In the meantime, however, the project had lost its internal sponsors: the Commissioner's resignation became effective, and the Deputy Commissioner also resigned.

The new Commissioner of Education inherited a worthwhile project and a politically sensitive issue as well. As of August, 1988, he had chosen to implement the Committee's revised fiscal reporting mechanisms and to place the major portion of the statewide database project on hold.

<u>Learnings from the Vermont Effort</u>

Both the process and the outcome (to date) of the SDE Database Project lead to some conclusions about four primary issues that can be of help to other states. While some of

the issues that Vermont considered are distinctly related to its rural nature, others could be expected to arise in larger states and urban areas as well.

First is the issue of unit of analysis: "Student"as the unit of analysis is considered the ideal for policy and planning purposes. Assignment of a unique identifier for each student enrolled in a Vermont school would enable database users to accurately track and analyze data across the spectrum of educational issues. However, "school"as the unit of analysis is far more advisable for both political and practical reasons. One of the concerns is confidentiality. Census data, for example, cannot be desegregated below certain threshold numbers in order to prevent identification of individuals, and in a state that places high value on local control, there is a concern about government's need to have access to a broad range of individualized information.

In practical terms, Vermont needs to be concerned with the availability of sophisticated hardware and software. It is not uniformly available throughout the state's supervisory unions and school districts, let alone at the school level. While the State Legislature appropriated funding for the state-level system, no consideration was given to ultimate costs for equipping and supporting sub-state units of school government that will be required to supply information to the SDE.

Second is the issue of rurality. Among the concerns here are the sparsity of model database systems, rural or otherwise, that could be replicated in Vermont, and questions about rural-specific information that could be of value to the state. The Regional Lab's commissioned report for Vermont on database development points out that while a number of states have initiated statewide database projects, none are fully operational and none lend themselves to immediate adoption in Vermont. Rather, the report suggests that a more intensive search might uncover models from sub-state database systems that could be of more value to rural states.

Questions about rural-specific database needs were not fully addressed by the Vermont project. Instead, the project was bounded by the range of existing information that is collected on students, faculty, and schools. These data do not distinguish rural from urban/suburban areas any better than Census definitions do; thus, critical dimensions such as sparsity of population and distances travelled to school are not available.

The Lab's consultant on database development advised the SDE that the database ought to include specialized information that would provide critical help in assessing and responding to the needs of rural schools. Among the indicators he recommended are the characteristics of rural school boards and the degree of involvement of students in extra-curricular activities. The report to the SDE also included a list of 37 items that the Southeastern Regional Council for Educational Improvement (forerunner of the Southeastern Educational Improvement Regional Laboratory) developed for inclusion in rural educational databases.

Finally, there is the issue of effecting and managing change. One of the recurring debates for the Ad Hoc Information Committee was related to when and how to involve others in the process of developing specifications for the statewide database. Some

Committee members wanted to include supervisory union, district, and school representatives from the beginning; others, including the Deputy Commissioner, were successful in defining the project in two distinct phases: internal development of the system and specifications, and then external review and comment.

Throughout the Committee's deliberations there were informal reports about feedback from people who would be required to use the state's system, and considerable time was spent discussing how to respond to them prior to formal public review and comment. The issue became defined as one of "mandated vs. voluntary change."

The unfortunate paradox is that the potential sub-state users were as anxious for change in the system as the Deputy Commissioner was, but their preliminary concerns were not responded to and some began to voice their concern that the state would implement a new system for which they would be held accountable. Thus, the SDE went public with its proposed system believing that there would be no consensus for a change that was desired by most everyone in the first place. Without consensus, and with a revised workplan that meant full operation could not be accomplished in less than a year and a half, the new Commissioner opted for a more reasonable and expeditious alternative: better, perhaps, to have partial success than wholesale delay.

Vermont is a small and tradition-conscious state. And its size is both a constraint and an opportunity to effecting change. It represents opportunity in the sense of policy- and decisionmakers knowing each other and their environments. There is a scale to events and conditions that is difficult to achieve in large states and cities. It is, nonetheless, constraining at times to live and to work and to introduce change in a small space; the slightest movement shifts the balance and, therefore, the established equilibrium. Whether the shift in balance is good or bad, necessary or a nuisance, time and more time is required in order for the inhabitants of a small space to accept and to adapt to the new balance.

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